



[D7.2] Critical Materials and Components (CM&C) suppliers' template

IDEALIST

3 INDUSTRIAL ECOSYSTEMS TACKLING SUPPLY CHAINS DISRUPTIONS AND BOOSTING ADVANCED TECHNOLOGIES UPTAKE



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Table of Contents

| | |
|---|----|
| Executive summary..... | 5 |
| 1. Presentation of IDEALIST Project..... | 6 |
| 2. Context and Methodology for scanning alternative suppliers of Critical Raw Materials & Components..... | 7 |
| 3. List of Critical Raw Materials & Components and their alternative suppliers..... | 9 |
| Antimony..... | 10 |
| Arsenic..... | 11 |
| Bauxite..... | 12 |
| Beryllium..... | 13 |
| Cobalt..... | 14 |
| Copper..... | 16 |
| Fluorspar..... | 19 |
| Natural Graphite..... | 20 |
| Graphene..... | 22 |
| Helium..... | 23 |
| Heavy Rare Earth Elements..... | 24 |
| Phosphorus..... | 25 |
| Light Rare Earth Elements..... | 26 |
| Lithium..... | 27 |
| Magnesium..... | 29 |
| Manganese..... | 30 |

D7.2 CM&C Suppliers template

| | |
|------------------------------|----|
| Nickel – Battery grade | 31 |
| Platinum Group Metals | 33 |
| Scandium..... | 35 |
| Titanium | 36 |

Executive summary

This deliverable provides a comprehensive framework to support SMEs in the Aerospace & Defence, Mobility & Automotive, and Energy-Intensive Industries by mitigating supply chain disruptions. It first identifies Critical Raw Materials (CRMs) and Components (CMCs) essential for adopting advanced technologies that drive the green and digital transitions. Then the document identifies primary global suppliers for strategic CRMs/CMCs and alternative sources within the EU member-states or countries having signed a trade agreement with the EU and/or a partnership on raw materials with the EU, ensuring resilience against geopolitical risks. This document aims to provide to industrial SMEs from the Aerospace & Defence, Mobility and Energy-Intensive Industries sectors a list of potential alternative suppliers for critical materials and components that they can reach to avoid future global chains disruption and improve their resilience towards future shocks. Updates every six months will incorporate emerging materials and supplier networks.

1. Presentation of IDEALIST Project

Coordinated by CIMES, IDEALIST's primary goal is to empower Small and Medium-sized Enterprises (SMEs) in three key industrial sectors: **Energy-intensive industries, Aerospace and Defence, and Mobility, Transport & Automotive**. These sectors are crucial to the European economy and face shared challenges, such as transitioning to sustainable practices, competitiveness in a context of limited raw materials and rising energy costs and adapting to changing consumer habits.

Funded under the HORIZON-CL4-2023-RESILIENCE-01 call, IDEALIST represents a strategic initiative aimed at bolstering the resilience and technological adaptability of SMEs within the European Union. The project indeed aims to transform SMEs from passive observers to active participants in these changes, especially in response to global events like the COVID-19 pandemic and the conflict initiated by Russia in Ukraine.

IDEALIST focuses on three main areas:

- **Strategic Foresight:** Developing tools and approaches to help SMEs anticipate and systematically prepare for change.
- **Technology Uptake:** Addressing barriers to adopting advanced technologies and fostering collaborations between tech-forward and traditional SMEs.
- **Supply Chain Resilience:** Identifying and mitigating critical dependencies and weaknesses to reduce the impact of disruptions on value chains.

The project will implement pilot projects to encourage collaboration across these ecosystems, using the **Hack&Match** method. It will also leverage the AGORA platform, led by EIT Manufacturing, to facilitate matchmaking and community building.

IDEALIST is a three-year Coordination and Support Action (CSA) whose consortium includes 14 partners from 6 European countries and Ukraine, reflecting its broad relevance and scope.

2. Context and Methodology for scanning alternative suppliers of Critical Raw Materials & Components

Supply disruptions and shortages caused by hazards (Fukushima) and geopolitical interventions, as well as pandemic and multipolar world order where raw materials have become a geopolitically strategic subject, have shown that disruptions in global supply chains can lead to shortages in critical raw materials and products the EU27 is highly dependent from. These disruptions especially affected European industrial ecosystems regarded as system-relevant and key for the European economy such as **Aerospace & Defence, Mobility** and **Energy-Intensive Industries**. These ecosystems substantially determine manufacturing in Europe in terms of production, logistics, and labour and their vulnerability led to concerns about the European industries' (lack of) sovereignty.

To cope with the new criticalities, the **2021 updated Industrial Strategy of the European Commission** has proposed a series of measures that focus on strengthening the resilience of the single market and supporting Europe's open strategic autonomy by addressing strategic dependencies among the others. Europe needs to further improve its open strategic autonomy in key areas such as **processors, semi-conductors** and all the so-called **critical raw materials** representing a key to its future sovereignty in technological, industrial, and economic terms, as well as from a societal point of view. Current critical materials and components shortages are affecting not only the "business as usual" but also the **uptake of advanced technologies among SMEs**. The supply chain bottlenecks experienced across European industries start with strategic component shortages, such as certain semiconductors: for example, lead times for "basic" semiconductors still extend past 40 weeks, on average, and for high-end components are more than 52 weeks.

IDEALIST project aims at developing a **model that can assist SMEs in detecting and anticipating disruptions in their supply chains**, contributing to reduce strategic dependencies on critical products, services and ATs. A key aspect of this support is to provide to SMEs a list of **new and/or alternative European potential suppliers for Critical Raw Materials and Components for Alternative Technologies** which are considered as strategic for the 3 industrial ecosystems represented in IDEALIT project: Aerospace & Defence, Mobility and Energy-Intensive Industries (Chemical Industries, Mining,

D7.2 CM&C Suppliers template

Polymers). Suppliers based in third countries which have signed a trade-agreement with the European union and/or a partnership on raw materials with the EU were also included as such agreements prevent potential unforeseen geopolitical disruptions.

The critical raw materials and components (CM&C) listed in the document were identified as strategic for the European industry by the 11 clusters partners of IDEALIST project representing the **Aerospace & Defence, Mobility & Automotive and Energy-Intensives Industries (Chemical industries, Raw Materials & Mining and Polymers & Composites industries)** ecosystems. To select the most strategic CM&C, the IDEALIST partners identified the **Advanced Technologies** enabling manufacturing SMEs from those ecosystems to implement their green and digital transition, hence improving their resilience to future shock and their competitiveness. Once those key Advanced Technologies were identified, the IDEALIST partners listed the components needed for their manufacturing and adoption such as batteries, sensors, advanced semi-conductors, nanotechnologies etc. The IDEALIST partners also worked on identifying within the list of **34 CRMs published by the European Commission in 2023** in the **Annex II of [the Regulation proposal COM\(2023\)](#)** the ones that were the most strategic for the 3 ecosystems represented in the project. For each Critical Raw Materials and Components identified, the present document provides a brief definition, the main producers countries currently supplying the European industry and a list of alternative suppliers based in EU or in third countries collaborating with EU through a free-trade agreement and/or a partnership on raw materials with the EU. The goal is to provide European SMEs alternative suppliers for those key critical raw materials and components on which depend competitiveness of manufacturing SMEs but also the digital and green transition of the European industry as such CM&C re key enablers to implement the EU's Green Deal (i.e. in renewable production, storage, transport etc.) The document will be updated every six months by IDEALIST project to incorporate any additional Critical Raw Materials & components or any new alternative suppliers.

3. List of Critical Raw Materials & Components and their alternative suppliers

Antimony

A metal used in flame retardants, lead-acid batteries, and alloys. It enhances hardness and strength in metals (iron, steel, titanium, aluminium, etc.).

The 3 main countries suppliers of this critical materials for the EU industry are China, Italy, India.

| Alternative suppliers based in EU member-states | | |
|---|--------------|---|
| Name | Localisation | On the market/project |
| Feinhütte Halsbrücke, smelter | Germany | Tin and lead smelter (secondary raw materials) in production |
| Campine NV | Belgium | Recycles and supplies antimony trioxide. www.campine.com . |
| Recyclex | France | Recyclex specializes in recycling lead-acid batteries and recovers antimony as a by-product from lead recycling. They are a significant player in the secondary recovery of antimony. |
| Metallo Group | Belgium | Part of the Aurubis group, Metallo recycles non-ferrous metals and materials, <i>including</i> those containing antimony, through its recovery processes. |
| Boliden AB | Sweden | Boliden is a leading metal recycling company in Europe and processes materials containing antimony, such as electronic waste and lead-acid batteries. |
| Umicore | Belgium | Global materials technology and recycling group in production |
| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | |
| Name | Localisation | On the market/project |
| Mandalay Resources, Costerfield project | Australia | In production |
| Larvotto resources, Hillgrove project | Australia | Project at evaluation stage. |

Arsenic

Often used in semiconductor applications due to its properties as a dopant in silicon and for producing gallium arsenide.

The 3 main countries suppliers of this critical materials for the EU industry are Peru, Germany and Belgium.

| Alternative suppliers based in EU member-states | | |
|---|--------------|---|
| Name | Localisation | On the market/project |
| PPM Reinstmetalle Osterwieck GmbH | Germany | High purity arsenic for mainly the electronic and opto-electronic industries. |
| Umicore | Belgium | Global materials technology and recycling group in production |
| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | |
| Name | Localisation | On the market/project |
| Campine | Peru | Link: www.campine.com . |

Bauxite

The primary ore of aluminum, essential for production of aluminum metals used in aerospace and transportation, besides from construction.

The main country supplier of this critical materials for the EU industry is Greece.

| Alternative suppliers based in EU member-states | | |
|---|--------------|-------------------------------------|
| Name | Localisation | On the market/project |
| Metlen Energy & Metals (MYTILINEOS Holdings) | Greece | Largest bauxite producer in Europe. |
| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | |
| Name | Localisation | On the market/project |
| Not identified | | |

Beryllium

A lightweight, stiff metal used in aerospace, telecommunications, and electronics for its excellent electrical and thermal conductivities.

The 2 main countries suppliers of this critical materials for the EU industry are United States and Khasakstan.

| Alternative suppliers based in EU member-states | | |
|---|--------------|--|
| Name | Localisation | On the market/project |
| Not identified | | |
| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | |
| Name | Localisation | On the market/project |
| Ulba Metallurgical Plant | Kazakhstan | It is one of the world leaders in terms of production of beryllium, tantalum, and niobium; in production |

Cobalt

It has significant role in various industries, especially in the production of batteries for electric vehicles and energy storage systems.

The 3 main countries suppliers of this critical materials for the EU industry are Australia, Canada and Congo.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Nickelhütte Aue, smelter | Germany | Nickelhütte Aue GmbH is a world leader in the recycling of nickel, copper and cobalt catalysts from the oil, gas and chemical industries; in production | Secondary raw materials |
| Freeport Cobalt Oy (Jervois Mining Ltd.), | Finland | Offers cobalt oxide. Link: www.jervoisfinland.com | Refinery |
| Glencore | Switzerland | Swiss multinational commodity trading and mining company; in production | |
| Rocklink | Germany | Lithium-Ion Battery & Rare Earth Magnet Recycling; in production | Secondary raw materials |
| Umicore | Belgium | Global materials technology and recycling group in production | |
| FinnCobalt, Hautalampi Nickel-Cobalt-Copper Project | Finland | Evaluation stage | Mining company |
| Boliden, Kevitsa project | Finland | In production | Mining company |
| Terrafame, Talvivaara project | Finland | In production | Mining company |
| Mawson Gold Ltd, Rompas–Rajapalot project | Finland | Evaluation stage | Mining company |
| Anglo American Plc, Sakatti project | Finland | Evaluation stage | Mining company |

D7.2 CM&C Suppliers template

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|--|---------|------------------|----------------|
| Suhanko Arctic Platinum, Suhanko project | Finland | Evaluation stage | Mining company |
|--|---------|------------------|----------------|

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|-----------------------|---------------------------------------|
| Name | Localisation | On the market/project | Comments |
| Ardea Resources, Kalgoorlie project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Australian Mines, Sconi project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Alliance Nickel, NiWest project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Greenstone Resources, Mt Thirsty project | Australia | Evaluation stage | Mining company |
| Metals X, Central Musgrave project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Sunrise Energy Metals. sunrise project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Panoramic Resources, Savannah project | Australia | On halt | Mining company (Nickel-cobalt-copper) |

Copper

The EC's 2023 critical raw materials list includes copper, recognizing its importance for the EU economy and its applications in renewable energy, electric mobility, and other digital technologies. The 3 main countries suppliers of this critical materials for the EU industry are Australia, Chile and Peru.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Feinhütte Halsbrücke, smelter | Germany | Tin and lead smelter (secondary raw materials) in production | Secondary raw materials |
| KGHM Polska Miedź S.A. | Poland | One of the largest producers of copper in Europe. Link: www.kghm.com/en | |
| Aurubis AG | Germany | Global supplier of non-ferrous metals and one of the world's largest copper recyclers; in production | |
| Boliden AB | Sweden | Multinational metals, mining, and smelting company producing zinc, copper, lead, nickel, silver, and gold; in production | |
| Nickelhütte Aue, smelter | Germany | Nickelhütte Aue GmbH is a world leader in the recycling of nickel, copper and cobalt catalysts from the oil, gas and chemical industries; in production | Secondary raw materials |
| Montanwerke Brixlegg AG | Austria | Copper recycling and refining; in production | Secondary raw materials |
| FinnCobalt, Hautalampi Nickel-Cobalt-Copper Project | Finland | Evaluation stage | Mining company |
| Terrafame, Talvivaara project | Finland | In production | Mining company |
| Anglo American Plc, Sakatti project | Finland | Evaluation stage | Mining company |
| Suhanko Arctic Platinum, Suhanko project | Finland | Evaluation stage | Mining company |
| Oxiana Resources NL, Skouriotissa copper mine | Cyprus | In production | Mining company |

D7.2 CM&C Suppliers template

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|--|---------------------------------------|
| Name | Localisation | On the market/project | Comments |
| Panoramic Resources, Savannah project | Australia | On halt | Mining company (Nickel-cobalt-copper) |
| Glencore plc | Switzerland | Swiss multinational commodity trading and mining company; in production | Mining company |
| Anglo American plc | UK | British multinational mining company; in production | Mining company |
| Minera Los Pelambres | Chile | Copper producer in production | Mining company |
| Antofagasta Minerals S.A. | Chile | Copper producer in production | Mining company |
| Ivanhoe Mines, Ltd. | Canada | Ivanhoe Mines is a mining company focused on discovering, developing and producing the critical resources essential for a low-carbon future (copper, zinc, nickel, palladium, platinum, rhodium and other green metals); owning copper mine in production in DRC | Mining company |
| BHP Billiton Plc | Australia | Australian multinational mining and metals public company; in production | Mining company |
| Sociedad Contractual Minera el Abra | Chile | Copper mine in operation | Mining company |
| Compañía Minera Dona Inés de Collahuasi | Chile | Copper producer in production | Mining company |

D7.2 CM&C Suppliers template

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|---------------------------|-----------|-------------------------------|----------------|
| Compañía Minera Zaldívar | Chile | Copper producer in production | Mining company |
| CODELCO-Chile | Chile | Copper producer in production | Mining company |
| Minera Antucoya | Chile | Copper producer in production | Mining company |
| Minera Centinela | Chile | Copper producer in production | Mining company |
| Teck | Canada | Copper producer in production | Mining company |
| Minera Escondida Limitada | Chile | Copper mines in operation | Mining company |
| Newmont, Cadia Mine | Australia | Copper mine in operation | Mining company |

Fluorspar

Essential in the manufacture of fluorinated chemicals, aluminium, and steel. The 3 main countries suppliers of this critical materials for the EU industry are China, Mexico and South Africa.

| Alternative suppliers based in EU member-states | | | |
|--|--------------|---|---|
| Name | Localisation | On the market/project | Comments |
| Erzgebirgische Fluss- und Schwerspatwerke GmbH, mining company | Germany | In operation | Primary raw materials |
| Genna Tres Montis | Italy | To return into operations soon. | Primary raw materials. It will be the largest Fluorspar mine in Europe. |
| Minersa Group | Spain | one of the largest producers of fluorspar in Europe. They operate mining and processing facilities in Spain and supply luorspar for various industries, including metallurgy and chemicals. | |
| S&B Industrial Minerals | Greece | Part of the Imerys Group has fluorspar mining operations in Greece. They supply high-quality fluorspar for industries like aluminum production, steelmaking, and chemical manufacturing. | |
| Tertiary Minerals plc, Storuman Fluorspar Project | Sweden | Evaluation stage | Mining company |
| Deutsche Flussspat, Käfersteige mine | Germany | Evaluation stage | Mining company |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|--|----------------|
| Name | Localisation | On the market/project | Comments |
| British Fluorspar Ltd | UK | Located in Derbyshire, UK, British Fluorspar operates the Milldam Mine, which is the last active fluorspar mine in the country. The company supplies metallurgical and acid-grade fluorspar used for steel production and chemical applications. | |
| Tivan, Speewah Fluorspar Deposit | Australia | Evaluation stage | Mining company |

Natural Graphite

Natural graphite is one of the crystalline forms of the element carbon. Its atoms are arranged in a stack of graphene sheets with a hexagonal structure. Natural graphite is found in metamorphic and magmatic rocks and in meteorites. The 3 main countries suppliers of this critical materials for the EU industry are China, Brazil and Mozambique.

| Alternative suppliers based in EU member-states | | | |
|--|--------------|--|----------------|
| Name | Localisation | On the market/project | Comments |
| Skaland Graphite AS | Norway | One of the world's highest-grade graphite producers Link: graphite.no | |
| SGL Carbon SE (www.sglcarbon.com) | Germany | Leader in graphite production, with a focus on both natural and synthetic graphite. While much of their focus is on synthetic graphite, they can also supply natural graphite for various industrial uses. | |
| Beowulf Mining, Aitolampi project | Finland | Early stage | Mining company |
| Talga Resources, Vittangi project | Sweden | Evaluation stage | Mining company |

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| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|---|----------------|
| Name | Localisation | On the market/project | Comments |
| Nouveau Monde Graphite | Canada | Though based in Canada, Nouveau Monde has significant operations in Europe, including partnerships with European companies for the supply of high-purity natural graphite. | |
| Imerys | Switzerland | Produces natural and synthetic graphite at multiple locations worldwide, including Europe. They focus on high-performance applications such as lithium-ion batteries, conductive materials, and refractories. | |
| Focus Graphite, Lac Knife project | Canada | Evaluation stage | Mining company |
| Lomiko Metals, La Loutre project | Canada | Evaluation stage | Mining company |
| Mason Graphite, Lac Guéret project | Canada | Evaluation stage | Mining company |
| Northern Graphite, Bissett Creek project | Canada | Evaluation stage | Mining company |
| GreenRoc Mining, Amitsoq project | Greenland | Early stage | Mining company |

Graphene

Graphene is obtained from graphite and is a simple two-dimensional sheet composed of carbon atoms arranged in a hexagonal pattern. The 4 main countries suppliers of this critical materials for the EU industry are Germany, Italy, Spain and UK.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|--|
| Name | Localisation | On the market/project | Comments |
| Graphene Square Europe GmbH | Germany | Link: www.graphenesq.com . | |
| BeDimensional S.p.A. | Italy | Link: https://www.bedimensional.com/ | |
| Directa Plus S.p.A. | Italy | Link: https://www.directa-plus.com/ | Mining company |
| Avanzare Materials | Spain | Link: www.avanzarematerials.com | Supplier that produces advanced nanomaterials, including graphene, for use in plastics, coatings, and other composite materials. |
| Graphenea | Spain | Link: www.graphenea.com | Design, manufacture and supply graphene-based chips and materials for your industrial and research needs. |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|--|--|
| Name | Localisation | On the market/project | Comments |
| Applied Graphene Materials | UK | Link: www.appliedgraphenematerials.com | Though based in the UK, AGM has significant operations in Europe and supplies graphene for coatings, composites, and functional materials. |
| Haydale | UK | Link: www.haydale.com | Graphene and nanomaterials, offering solutions to enhance the performance of materials in industries such as energy, aerospace, and healthcare. They develop functionalized nanomaterials for advanced composites and coatings |

Helium

Helium is the chemical element with atomic number 2 and symbol He. It is a noble gas (or rare gas), practically inert, the first of the family of noble gases in the periodic table of elements. It has the lowest boiling point of any known substance and exists in solid form only when subjected to a pressure greater than 25 atmospheres. The 4 main countries suppliers of this critical materials for the EU industry are United States, Algeria, Russia and Qatar.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|----------|
| Name | Localisation | On the market/project | Comments |
| Air Liquide | France | One of the largest suppliers of helium in Europe. They provide helium for industrial, medical, and research purposes. The company has significant operations across Europe, supplying both gaseous and liquid helium. | |
| Linde Group | Germany | Major supplier of helium in Europe. They have a global helium sourcing network and offer a variety of helium products for industries such as aerospace and electronics. | |

Heavy Rare Earth Elements

They are important for permanent magnets used in high-tech consumer electronics, defense applications, and renewable energy technologies. The 3 main countries suppliers of this critical materials for the EU industry are China, United States and Myanmar.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|--|----------|
| Name | Localisation | On the market/project | Comments |
| NPM Silmet OÜ | Estonia | One of the only facilities in Europe processing rare earth elements, including heavy rare earths. They process imported raw materials and supply rare earth products to the European market. | |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|--|----------------|
| Name | Localisation | On the market/project | Comments |
| Leading Edge Materials Corp | Canada | Focused on the production of CRM, including rare earth elements. They operate the Norra Kärr project in Sweden, which is one of the most significant sources of HREEs in Europe. | Strategic |
| Lynas Corp, Mt Weld project | Australia | In production | Mining company |
| Namibia Critical Metals, Lofdal project | Namibia | Evaluation stage | Mining company |
| Avalon Advanced Materials, Nechalacho project | Canada | Evaluation stage | Mining company |

Phosphorus

In agriculture, phosphorus is a key component of fertilizers, which are critical for plant growth. In industry, phosphorus is used in the production of detergents, flame retardants, and other chemicals. The 3 main countries suppliers of this critical materials for the EU industry are China, United States and Vietnam.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|-----------------------|----------------|
| Name | Localisation | On the market/project | Comments |
| Yara, Siilinjärvi mine | Finland | In production | Mining company |

Light Rare Earth Elements

The European Commission defines Light Rare Earth Elements (LREEs) as the elements in the lanthanide series from lanthanum (La) to europium (Eu). These include lanthanum, cerium, praseodymium, neodymium, promethium, samarium, and europium, and are characterized by their relatively lighter atomic masses within the lanthanide series. The 3 main countries suppliers of this critical materials for the EU industry are Germany, Canada and Australia.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|--|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Rocklink | Germany | Lithium-Ion Battery & Rare Earth Magnet Recycling; in production | Secondary raw materials |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|-----------------------|----------------|
| Name | Localisation | On the market/project | Comments |
| Lynas Corp, Mt Weld project | Australia | In production | Mining company |
| Arafura Resources, Nolan's project | Australia | Evaluation stage | Mining company |
| Hastings Technology metals, Yangibana project | Australia | Evaluation stage | Mining company |
| Rarex, Cummins Range project | Australia | Evaluation stage | Mining company |
| Avalon Advanced Materials, Nechalacho project | Canada | Evaluation stage | Mining company |
| Commerce Resources, Ashram project | Canada | Evaluation stage | Mining company |
| Defense Metals, Wicheda project | Canada | Evaluation stage | Mining company |
| Vital Metals, Nechalacho project | Canada | Evaluation stage | Mining company |

Lithium

Critical for lithium-ion batteries used in electric vehicles. The 3 main countries suppliers of this critical materials for the EU industry are Australia, China and Argentina.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|--|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Imerys, Lithium mining project | France | Lithium mica mining site and conversion plant to hydroxyde lithium currently in project, planned to open in 2028 | Mining company |
| Savannah Resources Plc | Portugal | Link: www.savannahresources.com | Mining company |
| Infinity Lithium | Spain | Also in Australia, largest sustainable lithium project in EU. | Mining company |
| European Lithium, Wolfsberg project | Austria | Aims to be the first local lithium supplier into an integrated European battery supply chain; Evaluation stage | Mining company |
| Zinnwald Lithium | Germany | Project at the evaluation stage (not yet in production) | Mining company |
| European Metals Hldgs | CZ | Project at the evaluation stage (not yet in production) | Mining company |
| European Lithium, Leinster Lithium Project | Ireland | Evaluation stage | Mining company |
| Rocklink | Germany | Lithium-Ion Battery & Rare Earth Magnet Recycling; in production | Secondary raw materials |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--|-----------------------|----------------|
| Name | Localisation | On the market/project | Comments |
| Albemarle | Australia and other locations | In production | Mining company |
| Allkem | Australia, Argentina and other locations | In production | Mining company |
| Core Lithium, Finnis project | Australia | In production | Mining company |
| Livent | Agentina and other locations | In production | Mining company |

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| | | | |
|---------------------------------|-----------|-----------------------------|----------------|
| Sayona Mining | Canada | In production | Mining company |
| Liontown Resources | Australia | Financed/Construction stage | Mining company |
| Rock Tech Lithium | Canada | Evaluation stage | Mining company |
| Lepidico, Karib project | Namibia | Evaluation stage | Mining company |
| Frontier Lithium, PAK project | Canada | Evaluation stage | Mining company |
| Critical Elements, Rose project | Canada | Evaluation stage | Mining company |
| AVZ Minerals, Manono project | DRC | Evaluation stage | Mining company |

Magnesium

Lightweight metal used in automotive and aerospace applications for lightweighting. The 3 main countries suppliers of this critical materials for the EU industry are China, Russia and United States.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| MAGONTECH GmbH | Germany | Magontec operates magnesium recycling and production plants in Germany, providing magnesium alloys for use in automotive, electronics, and other sectors. | Secondary raw materials |
| Grecian Magnesite S.A. | Greece | Magnesite products and grades for practically all industrial applications. | Mining company |
| Verde Magnesium | Romania | Evaluation stage | Mining company |
| Magnesium Solutions Europe GmbH | Germany | Metal recycling company in production | Secondary raw materials |
| Zinnwald Lithium | Germany | Evaluation stage | Secondary raw materials |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|---|----------------|
| Name | Localisation | On the market/project | Comments |
| Rima International | Brazil | Leading supplier of magnesium products, specializing in primary magnesium, alloys, and magnesium products for various industries, including automotive and aerospace. | Strategic |
| Esan Eczacıbaşı Endüstriyel Hammaddeler | Turkey | Turkey's largest producers of industrial minerals, including magnesium. | Mining company |

Manganese

Manganese is also crucial in the production of aluminum alloys, batteries, and various chemicals. The 3 main countries suppliers of this critical materials for the EU industry are South Africa, China and Australia.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Nickelhütte Aue, smelter | Germany | Nickelhütte Aue GmbH is a world leader in the recycling of nickel, copper and cobalt catalysts from the oil, gas and chemical industries; in production | Secondary raw materials |
| Eramet | France | Link: www.eramet.com | |
| Euro Manganese, Chvaletice project | CZ | Evaluation stage | Mining company |
| Rocklink | Germany | Lithium-Ion Battery & Rare Earth Magnet Recycling; in production | Secondary raw materials |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|-----------------------|----------------|
| Name | Localisation | On the market/project | Comments |
| Element 25, Butcherbird project | Australia | Evaluation stage | Mining company |
| Manganese X Energy, Battery Hill project | Canada | Evaluation stage | Mining company |

Nickel – Battery grade

The European Commission defines battery-grade nickel as a high-purity form of nickel specifically processed to meet the stringent quality requirements for use in batteries, particularly in electric vehicle (EV) batteries. This grade of nickel is crucial for the performance, efficiency, and longevity of battery technologies, such as nickel-cobalt-aluminum (NCA) and nickel-manganese-cobalt (NMC) chemistries, which are widely used in rechargeable lithium-ion batteries. The 3 main countries suppliers of this critical materials for the EU industry are Australia, Indonesia and Brazil.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Eramet | France | Eramet is a French multinational mining and metallurgy company, listed on the Euronext Paris exchange under the symbol ERA. | Secondary raw materials |
| Rocklink | Germany | Lithium-Ion Battery & Rare Earth Magnet Recycling; in production | Secondary raw materials |
| FinnCobalt, Hautalampi Nickel-Cobalt-Copper Project | Finland | In production | Mining company |
| Anglo American Plc, Sakatti project | Finland | Evaluation stage | Mining company |
| Suhanko Arctic Platinum, Suhanko project | Finland | Evaluation stage | Mining company |
| Umicore | Belgium | Global materials technology and recycling group in production | Secondary raw materials |
| Boliden, Kevitsa project | Finland | In production | Mining company |

D7.2 CM&C Suppliers template

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|-----------------------|---------------------------------------|
| Name | Localisation | On the market/project | Comments |
| Ardea Resources, Kalgoorlie project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Australian Mines, Sconi project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Alliance Nickel, NiWest project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Metals X, Central Musgrave project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Sunrise Energy Metals. sunrise project | Australia | Evaluation stage | Mining company (Nickel-cobalt) |
| Panoramic Resources, Savannah project | Australia | On halt | Mining company (Nickel-cobalt-copper) |
| Poseidon Nickel, Black Swan project | Australia | Evaluation stage | Mining company |
| Sherritt International Corporation | Canada | In production | Mining company |
| Glencore plc | Switzerland | In production | Mining company |

Platinum Group Metals

It is a group of six metallic elements: platinum, palladium, rhodium, ruthenium, iridium, and osmium. These metals are valued for their catalytic properties, resistance to wear and tarnish, and electrical conductivity, and are used in automotive catalytic converters, electronics, jewelry, and industrial applications. The 3 main countries suppliers of this critical materials for the EU industry are South Africa, Russia and Zimbabwe.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Umicore | Belgium | One of the leading suppliers of platinum and other PGMs in Europe. They focus on sustainable sourcing and recycling of platinum for a variety of applications, including renewable energy, automotive catalysts, and fuel cells. | Secondary raw materials |
| Haereus Group | Germany | Family-run, it is one of the largest global suppliers of precious metals, including platinum. They offer a wide range of platinum products for industries such as automotive, electronics, jewelry, and medical applications. Heraeus specializes in refining, trading, and fabricating platinum and other precious metals. | |
| Boliden, Kevitsa project | Finland | In production | Mining company |
| Anglo American Plc, Sakatti project | Finland | Evaluation stage | Mining company |
| Suhanko Arctic Platinum, Suhanko project | Finland | Evaluation stage | Mining company |
| KGHM Polska Miedź SA | Poland | In production | Mining company |
| Saxonia Edelmetalle GmbH | Germany | Refinery recycles precious metals and the production of precious metal products | Secondary raw materials |
| Wieland Edelmetalle GmbH | Germany | Halsbrücke and Pforzeim refineries | Secondary raw materials |
| C. Hafner GmbH | Germany | Pforzheim and Wimsheim refineries | Secondary raw materials |
| Heimerle + Meule GmbH | Germany | Pforzheim refinery | Secondary raw materials |
| Chimet Spa (Arezzo) | Italy | Refining and recovery precious metals company | Secondary raw materials |

D7.2 CM&C Suppliers template

| Alternative suppliers based in EU member-states | | | |
|---|--------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Safimet Spa (Arezzo, Vicenza) | Italy | Safimet specialises in recovery and refining of precious metals from industrial processing waste and the production of galvanic salts | Secondary raw materials |
| TCA Spa | Italy | Recovery and refining of precious metals through pyrometallurgical processes in their facilities in Castelluccio (province of Arezzo) and Valenza (province of Alessandria) | Secondary raw materials |
| Italpreziosi Spa (Arezzo) | Italy | Italpreziosi was founded in 1984 and is a main operator in the production, refining and trading of precious metals, production and trade of investment gold based in Arezzo, Italy. | Secondary raw materials |
| Safina AS | CZ | Refining and recycling of precious metals | Secondary raw materials |
| WEEECycling SAS | France | WEEECycling reprocesses all waste containing precious metals, liquid or solid, from all industrial sectors. After refining at their Tourville les Ifs site, where all the operations take place, the metals are transformed into new raw materials. | Secondary raw materials |
| Remondis PMR BV and Elephant | NL | REMONDIS PMR is based in the Netherlands and has been recycling waste materials containing precious metals for four decades now. | Secondary raw materials |
| Sempra JP | Spain | Recycling of precious and industrial materials | Secondary raw materials |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|----------------------------|--|-----------|
| Name | Localisation | On the market/project | Comments |
| Johnson Matthey | UK | British multinational known for its role in platinum-group metals (PGM), involved in platinum refining, producing, and recycling for use in catalysts, electronics, and other high-tech industries. Their platinum products are widely used in the automotive sector for catalytic converters. | Strategic |
| Tanaka Precious Metals | Japan / Germany Operations | While Tanaka is a Japanese company, they have significant operations in Germany and supply platinum to the European market. They offer platinum products for industrial use, including in electronics, chemicals, and catalysts. | |

Scandium

Used in aerospace components, athletics equipment, and in some metal halide lamps. The 3 main countries suppliers of this critical materials for the EU industry are China, Japan and Russia.

| Alternative suppliers based in EU member-states | | | |
|---|--------------|--|----------|
| Name | Localisation | On the market/project | Comments |
| Eramet | France | French multinational mining and metallurgy company, also involved in scandium production through its projects focused on the extraction and refining of CRM, including scandium, for use in aerospace, automotive, and defense industries. | |
| ScaVanger company | France | On going project; producing Sc-products from Bauxite Residue (Mytilineos, Greece) | Refinery |

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|--------------|--|----------------|
| Name | Localisation | On the market/project | Comments |
| Scandium International Mining Corp. | USA | While headquartered outside Europe, Scandium International works with European partners to supply scandium for applications like fuel cells, aerospace components, and aluminum-scandium alloys. | |
| Rio Tinto, Iron and Titanium | Canada | In production | Mining company |

Titanium

Known for its strength, low density, and corrosion resistance, used extensively in aerospace besides from biomedical applications (e.g. prosthesis). The 3 main countries suppliers of this critical materials for the EU industry are China, Japan and Russia.

| Alternative suppliers based in EU member-states | | | |
|---|------------------|---|-------------------------|
| Name | Localisation | On the market/project | Comments |
| Nickelhütte Aue, smelter | Saxony, Germany | French multinational mining and metallurgy company, also involved in scandium production through its projects focused on the extraction and refining of CRM, including scandium, for use in aerospace, automotive, and defense industries. | Secondary raw materials |
| Titanium International Group Srl | Italy | Italian-based supplier and distributor of titanium products for a wide range of industries, including aerospace, automotive, medical, and chemical. They specialize in titanium alloys and provide metal in forms such as bars, plates, and sheets. | |
| Kenmare Resources | Ireland | Link: www.kenmareresources.com | |
| EcoTitanium | France | EcoTitanium produces aerospace premium quality titanium alloys by recycling cuttings and scrap to produce titanium ingots. | Secondary raw materials |
| Aubert & Duval | France | Aubert & Duval has developed the first integrated titanium supply chain in Europe to offer a comprehensive solution to aerospace customers and meet their demands for vertical integration. This supply chain includes: <ul style="list-style-type: none"> • The production of aerospace-grade titanium ingots at EcoTitanium through the recycling of scraps and chips. • Transformation through forging at UKAD or die forging at Aubert & Duval. | |
| Timet | France (Ugine) | Production and processing of titanium and its alloys: <ul style="list-style-type: none"> •Manufacturing of ingots, billets, tubes, and other forged products •Specialist in the production of forged billets in titanium and titanium alloys of aerospace quality | |
| Imet Alloys | France (Corrèze) | IMET Alloys specializes in recycling noble and rare materials, particularly titanium. IMET Alloys Corrèze will play a key role upstream of EcoTitanium's operations. | Secondary raw materials |

D7.2 CM&C Suppliers template

| Alternative suppliers based in third countries that have signed a trade agreement with the EU and/or a partnership on raw materials with the EU | | | |
|---|-----------------------------|---|----------------|
| Name | Localisation | On the market/project | Comments |
| ADMA Products, Inc. | USA / Luxembourg Operations | ADMA Products, with its European operations in Luxembourg, focuses on advanced manufacturing and supplying titanium powder and components for additive manufacturing, aerospace, and defense applications (www.admaproducts.com). | |
| Metalysis | UK | Specialized in producing titanium powder for additive manufacturing (3D printing) and other advanced manufacturing industries. key supplier in the European market. | Mining company |
| YKTMK (Kazakh UKTMP) | Kazakhstan | One of the world's largest producers of spongy titanium and magnesium in the form of bars and powder; in production | Mining company |
| UMCC Titanium, Irshansk Mining and Processing Plant | Ukraine | Irshansk Mining and Processing Plant located in Ukraine specializes in the extraction and enrichment of ilmenite ores (titanium ore); in production | Mining company |